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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,000

08/18/2006

Alexander Apolonski

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EXAMINER

HAGAN, SEAN P

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

04/01/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,000	Applicant(s) APOLONSKI ET AL.	
	Examiner SEAN HAGAN	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>14 January 2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1 through 11 originally filed 11 May 2006. Claims 1 through 11 amended by amendment received 11 May 2006. Claims 1 through 11 cancelled by amendment received 14 January 2008. Claims 12 through 20 added by amendment received 14 January 2008. Claims 12 through 20 are pending in this application.

Response to Arguments

2. Applicant's arguments have been fully considered but they are not persuasive.

3. Regarding argument that cited prior art does not teach the entire negative dispersion of a system determined by dispersive mirrors with negative dispersion, Szipocs et al. (Szipocs, US Patent 5,734,503) in col. 5, lines 12-16 discloses the intended use of the disclosed negative dispersion mirrors as a replacement of prior methods of achieving negative dispersion involving prism pairs. It is thus determined that a system according to the teachings of Szipocs would not include any elements to provide negative dispersion other than the negative dispersion mirrors.

4. Regarding argument that cited prior art fails to teach the use of negative dispersion elements to provide a net positive dispersion in a mode locked laser, Cho et al. ("Generation of 90-nJ pulses with a 4-MHz repetition-rate Kerr-lens mode-locked Ti:Al₂O₃ laser operating with net positive and negative intracavity dispersion," Opt. Lett. 26, 560-562 (2001), hereafter Cho) in pg. 561, col. 2, starting "Using positive dispersion

mode locking..." discloses a system incorporating negative dispersion elements configured to present a positive dispersion output.

5. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

6. Accordingly, all claims are now addressed as follows:

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 12, 13, 14, 15, 16, 18, 19, and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Cho in view of Szipocs.

9. ***Regarding claim 12***, Cho discloses, "A resonator comprising resonator components including a laser crystal" (Fig. 1). "A plurality of mirrors including a pump beam coupling-in mirror" (Fig. 1). "A laser beam out-coupling mirror and a multiple reflection telescope for enlarging the resonator length" (Fig. 1). "A first set of the resonator components having a positive dispersion" (pg. 561, col. 2, starting "Using positive dispersion mode locking..."). "Said resonator in operation having a positive

averaged dispersion over an operating wavelength range" (Cho pg. 561, col. 2, starting "Using positive dispersion mode locking..."). Cho does not disclose, "Said plurality of mirrors including dispersive mirrors with a negative dispersion for compensating in part the positive dispersion of the first set of the resonator components." "Wherein the entire negative dispersion of the resonator is determined only by the dispersive mirrors with the negative dispersion." Szipocs discloses, "Said plurality of mirrors including dispersive mirrors with a negative dispersion for compensating in part the positive dispersion of the first set of the resonator components" (col. 3, lines 51-65). "Wherein the entire negative dispersion of the resonator is determined only by the dispersive mirrors with the negative dispersion" (col. 5, lines 12-16). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Cho with the teachings of Szipocs. The use of dispersive mirrors as disclosed by Szipocs would enhance the teachings of Cho by introducing more stable dispersive elements (Szipocs, col. 3, lines 51-65).

10. **Regarding claim 13**, Cho does not disclose, "Wherein the positive averaged dispersion of the resonator is in a range of 0 and 100 fs²." It would have been obvious to one of ordinary skill in the art at the time of invention to set dispersion between 0 and +100 fs², since it has been held that where the general conditions for a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

11. **Regarding claim 14**, Cho does not disclose, "Wherein the positive averaged dispersion is in a range of 0 and 50 fs²." It would have been obvious to one of ordinary skill in the art at the time of invention to set dispersion between 0 and +50 fs², since it has been held that where the general conditions for a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

12. **Regarding claim 15**, Cho does not disclose, "Wherein the multiple reflection telescope comprises at least one of the dispersive mirrors with the negative dispersion." Szipocs discloses, "Wherein the multiple reflection telescope comprises at least one of the dispersive mirrors with the negative dispersion" (col. 3, lines 51-65). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Cho with the teachings of Szipocs for the reasons given above regarding claim 1.

13. **Regarding claim 16**, Cho does not disclose, "Wherein all the mirrors of the resonator are the dispersive mirrors with the negative dispersion." Szipocs discloses, "Wherein all the mirrors of the resonator are the dispersive mirrors with the negative dispersion" (col. 3, lines 51-65). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Cho with the teachings of Szipocs for the reasons given above regarding claim 1.

14. **Regarding claim 18**, Cho discloses, "Wherein the laser arrangement is configured to provide passive mode-locking" (pg. 560, col. 1, starting "In this Letter...").

15. **Regarding claim 19**, Cho discloses, "Wherein a Kerr-lens mode-locking principle is used for the passive mode-locking" (pg. 560, col. 1, starting "In this Letter...").

16. **Regarding claim 20**, Cho discloses, "A saturable absorber positioned and configured to perform the passive mode-locking" (pg. 560, col. 1, starting "In this Letter...").

17. Claim 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Cho in view of Szipocs and further in view of Cunningham et al. (Cunningham, US Patent 5,701,327).

18. **Regarding claim 17**, Cho does not disclose, "The resonator comprising a pair of glass wedges with positive dispersion configured to provide a supplementary dispersion fine adjustment." Cunningham discloses, "The resonator comprising a pair of glass wedges with positive dispersion configured to provide a supplementary dispersion fine adjustment" (col. 6, lines 42-44). It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Cho with the teachings of Cunningham. Inclusion of wedges for fine tuning pulse characteristics as taught by Cunningham would enhance the teachings of Cho and Szipocs by allowing for

introduction of minute alterations of dispersion should such alterations present themselves as necessary.

Conclusion

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

20. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN HAGAN whose telephone number is (571)270-1242. The examiner can normally be reached on Monday-Friday 7:30 - 5:00.

22. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun O. Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2828

23. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. H./

Examiner, Art Unit 2828

/Minsun Harvey/

Supervisory Patent Examiner, Art Unit 2828